AMENDMENTS TO THE SPECIFICATION

Please DELETE the section headings at page 5, lines 10-11.

Please replace the section heading beginning at page 6, line 1 with the following rewritten paragraph:

-- ~~MEANS FOR SOLVING THE PROBLEMS~~SUMMARY OF THE INVENTION --

Please DELETE the section heading at page 9, line 5.

Please DELETE the section heading and paragraph beginning at page 10, line 16 and ending at page 11, line 12.

Please replace the section heading beginning at page 11, line 14 with the following rewritten paragraph:

-- ~~BEST MODE FOR CARRYING OUT~~DETAILED DESCRIPTION OF THE INVENTION --

Please replace paragraph [0024] at page 14 with the following rewritten paragraph:

-- The insulating substrates 10 used in the present invention may be synthetic resin films having excellent heat resistance, chemical resistance, and humidity and heat stability. Examples of the synthetic resin films include polyimide films, polyamideimide films, heat-resistant polyester films, BT resin films, phenolic resin films and liquid crystal polymer films. Of these, in the present invention polyimide films are preferable because of their prominent heat resistance, chemical resistance, and humidity and heat stability. The insulating substrate 10 generally has a thickness of 5 to 150 μm, preferably 5 to 125 μm. The conductive metal foil 25 placed on the insulating substrate 10 has a thickness equal to or slightly greater than that of the insulating substrate 10. Specifically, the conductive metal foil 25 generally has a thickness of ~~50~~5.0 to 200 μm, preferably ~~80~~8.0 to 120 μm. That is, the conductive metal foil 25 is generally 100 to 300% thicker, preferably 200 to 240% thicker than the insulating substrate 10. When the slightly thicker conductive metal foil 25 is used,

both ends of the conductive metal pieces 22 slightly protrude from the surfaces of the insulating substrate 10. The exposed protrusions can be caulked to prevent detachment of the conductive metal pieces 22 from the through holes 21. --

Please replace paragraph [0029] at page 17 with the following rewritten paragraph:

-- The double-sided wiring boards 20 for manufacturing a multilayer wiring board 50 of the present invention are produced as follows. Using the double-sided metal clad laminates 13 having the conductive metal layers 12a and 12b on both surfaces, or the double-sided metal clad laminates 43 having the conductive metal layers 42a and 42b on both surfaces, for example, photoresist layers are formed on the conductive metal layers 12a and 12b as shown in Fig. 2, and are exposed to light and developed to form photoresist patterns 14a and 14b on the conductive metal layers 12a and 12b. The conductive metal layers 12a and 12b are selectively etched using the patterns 14a and 14b as masks. Referring to Fig. 2, the wiring patterns ~~12a and 12b~~15a and 15b on the front and back surfaces of the insulating substrate 10 are electrically connected through the conductive metal pieces 22 filled in the insulating substrate 10. --

Please replace paragraphs [0031], [0032], [0033] and [0034] at pages 18-21 with the following rewritten paragraphs:

-- The double-sided wiring board 20-1 on the right side in Fig. 1 has the wiring pattern 15b on the back surface, to which the double-sided wiring board 20-2 on the left side is laminated. Specifically, a wiring (connection terminal) 30d and a wiring (connection terminal) ~~30e~~30c are to be connection terminals. The double-sided wiring board 20-2 has the wiring pattern 15a on the front surface, to which the mating wiring board is laminated. Specifically, a wiring (connection terminal) ~~31d~~31b and a wiring (connection terminal) ~~31e~~31a are to be connection terminals.

To establish an electrical connection between the double-sided wiring boards 20-1 and 20-2 that are laminated, low-melting conductive metal layers 33 are formed on the surface of the connection terminals 30d and ~~30e~~30c on the back surface of the double-sided wiring board 20-1, and the surface of the connection terminals 31a and 31b on the front surface of the double-sided wiring board 20-2. The low-melting conductive metal layers 33

are generally composed of a metal or alloy having a melting point of not more than 300°C, preferably from 180 to 240°C. Examples of the low-melting metals and alloys include solder, lead-free solder, tin~~, gold~~ and nickel-gold. The low-melting conductive metal layers 33 may include one or more metals and alloys in combination. That is, the low-melting conductive metal layers 33 may be single layers of these metals or alloys, or laminates of a plurality of such layers.

The low-melting conductive metal layers 33 of the above metals or alloys may be formed on the connection terminals 30d, ~~30e~~30c, 31a and 31b by various methods. In the present invention, plating is advantageous for forming the low-melting conductive metal layers 33. When forming the low-melting conductive metal layers 33 by plating, the surface of the wiring patterns 15a and 15b that are on the double-sided wiring boards 20-1 and 20-2 and do not participate in the electrical connection between the double-sided wiring boards 20-1 and 20-2 is preferably protected by resin films or the like. That is to say, the connection terminals 30d and ~~30e~~30c, and the connection terminals 31a and 31b are selectively exposed from the surface of the double-sided wiring boards 20-1 and 20-2, and the other area is coated with the resin, followed by plating. The selective application of the protective resin may be performed using screen masks masking the connection terminals 30d and ~~30e~~30c, and the connection terminals 31a and 31b. According to the present invention, the protective resin may be a polyimide adhesive resin, which is used for forming adhesive layers as will be described later. It is preferable that the polyimide adhesive resin is applied through screen masks as described, and is cured temporarily by heating.

The connection terminals 30d and ~~30e~~30c, and the connection terminals 31a and 31b are selectively exposed from the surface of the double-sided wiring boards 20-1 and 20-2 as described above. The double-sided wiring boards 20-1 and 20-2 are immersed in a plating solution containing a desired metal, and the connection terminals 30d and ~~30e~~30c, and the connection terminals 31a and 31b are plated, resulting to form the low-melting conductive metal layers 33. Particularly preferably, in the present invention the low-melting conductive metal layer 33 is at least one plated metal layer selected from the group consisting of plated solder layer, plated lead-free solder layer, plated tin layer~~, plated gold layer~~ and plated nickel-gold layer. Particularly, in the present invention the low-melting conductive metal layer 33 is preferably a plated solder layer or a plated lead-free solder layer. The low-melting conductive metal layers 33 may be formed by electroplating or electroless plating. --

Please replace paragraph [0038] at page 22 with the following rewritten paragraph:

-- The low-melting conductive metal layers 33 are formed on the connection terminals 30d and ~~30e~~30c, and the connection terminals 31a and 31b as described above. Subsequently, adhesive layers 35-1 and 35-2 are formed on mating surfaces at which the double-sided wiring boards 20-1 and 20-2 are bonded. Namely, the adhesive layers 35-1 and 35-2 are formed such that the connection terminals 30d and ~~30e~~30c will be exposed on the back surface of the double-sided wiring board 20-1 and the connection terminals 31a and 31b will be exposed on the front surface of the double-sided wiring board 20-2. The adhesive used in the present invention is a polyimide adhesive resin. The polyimide adhesive resin of the present invention contains hard segments having a polyimide group, and soft segments which bind the hard segments. The hard segment is a typical aromatic polyimide skeleton represented by Formula (I) below. The soft segment is a siloxane polyimide skeleton represented by Formula (II) below. --

Please replace paragraph [0041] at page 24 with the following rewritten paragraph:

-- The polyimide adhesive resins generally have a weight-average molecular weight of about ~~300,000~~30,000 to 150,000. --

Please replace paragraph [0043], [0044], [0045] and [0046] at pages 25-27 with the following rewritten paragraph:

-- The polyimide adhesive resin is applied to the back surface of the double-sided wiring board 20-1 such that the connection terminals 30d and ~~30e~~30c will be exposed. The polyimide adhesive resin is applied to the front surface of the double-sided wiring board 20-2 such that the connection terminals 31a and 31b will be exposed. In the present invention, it is necessary that the polyimide adhesive resin be applied such that the connection terminals will be exposed on the bonding surfaces of the double-sided wiring boards. The selective application of the polyimide adhesive resin can be performed using screen masks. Specifically, the screen masks cover the areas including the connection terminals that should avoid the application of the polyimide adhesive resin, and the polyimide

adhesive resin is selectively applied to desired areas. In the event that the masks used in the plating of the low-melting conductive metal layers 33 are a temporarily cured polyimide adhesive resin, the temporarily cured polyimide adhesive resin layers may be used as adhesive layers.

The polyimide adhesive resin is desirably applied in a thickness that is substantially the same level as the surface of the connection terminals 30d and ~~30e~~30c, and the surface of the connection terminals 31a and 31b. The thickness (as measured after the solvent is removed) is generally from 5 to 20 μm, preferably from 10 to 15 μm.

The adhesive layers 35-1 and 35-2 are formed on the double-sided wiring boards 20-1 and 20-2, respectively, as described above. The double-sided wiring boards are arranged such that the adhesive layers 35-1 and 35-2 are opposed and further such that the connection terminals 30d and ~~30e~~30c on the double-sided wiring board 20-1 are faced to the connection terminals 31b and 31a on the double-sided wiring board 20-2 each other. Subsequently, the double-sided wiring board 20-1 and the double-sided wiring board 20-2 are pressed against one another with heating. The heating temperature is at least the curing temperature of the polyimide adhesive resin in order that the double-sided wiring boards are bonded, and is generally in the range of 150 to 300°C, preferably 190 to 250°C. The wiring boards are pressed against one another at a pressure of about 1 to 4 kg/cm^2 at the above temperature for 1 to 20 seconds, preferably 5 to 10 seconds. Consequently, the polyimide adhesive resin develops adhesion between the double-sided wiring boards 20-1 and 20-2 and forms an adhesive layer 35 which bonds and integrates the double-sided wiring boards 20-1 and 20-2. The laminate in which the double-sided wiring boards 20-1 and 20-2 are bonded and integrated with the polyimide adhesive resin may be subjected to additional heating and pressing as required, whereby the bond strength of the laminate may be improved.

The heating under pressure, optionally accompanied by application of ultrasonic waves, melts the metals or alloys of the low-melting conductive metal layers 33 on the mating connection terminals 30d and 31b, and the mating connection terminals ~~30e~~30c and 31a. Consequently, the conductive metal layers in contact with each other are unified to form connection metal layers 34. The connection metal layers 34 electrically connect the double-sided wiring boards 20-1 and 20-2. --

Please replace paragraph [0073] at page 36 with the following rewritten paragraph:

-- As shown in Fig. 6, the average electrical resistance was ~~2.25~~2.64 mΩ, with 3.66 mΩ maximum and 1.92 mΩ minimum. The double-sided wiring boards had little resistance variation and proved excellent electrical properties. --